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23 August 1966 25X1

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Dear Walt:

Attached please find a document entitled "Addendum B to the Purchase Description for Gamma I Rectifiers", which is submitted as an item of increased scope to contract No. SM-2147. This proposed modification and its associated cost estimate is presented in two sections; the first covering the preparation of the accuracy test procedure together with related computer programming, and the second covering the actual testing required to verify each rectifier's accuracy. Implementation of this modification covering the tasks outlined in Addendum B, plus the subsequent testing of the two Gamma I Rectifiers currently covered under contract No. SM-2147 will require an increase of [redacted] in the existing 25X1
25X1 contract value of [redacted]

We would like to point out that our proposal of 18 August to supply 1 additional Gamma I Rectifier under contract No. SM-2147 did not include any provision for performing accuracy verification tests. If the government desires these tests to be performed on the proposed additional unit, then it will be necessary to increase the contract value by [redacted] over 25X1
and above any amounts previously quoted.

25X1 If you should require any further information, do not hesitate to contact [redacted] of our Government Contracts organization.

Sincerely,

[redacted]

25X1 Engineering & Manufacturing Division

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NRO review(s) completed.

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Addendum B to the
PURCHASE DESCRIPTION FOR GAMMA I RECTIFIERS

This addendum modifies the previous Gamma I Purchase Description, dated 17 March 1966, entitled "Purchase Description for Gamma I Rectifier" and is in addition to the addendum, dated 21 March 1966, entitled "Addendum to the Purchase Description for Gamma I Rectifiers", which pertains to the inclusion of an extended altitude range not previously considered. Addendum B, herein, modifies the accuracy statement of the Gamma I equipment, requiring revision of the following paragraphs as stated.

Paragraph I-I Accuracy

The equipment shall meet both of the following accuracy requirements:

a. Total distortions from all sources shall be minimized to the extent that a calibrated grid (furnished by Government), of 50 or more known points uniformly distributed over the entire format (35 degrees each side of nadir normal to the flight direction), shall when projected produce a rectified enlargement on which known points will have a CPE not greater than 250 microns at the enlarged scale after a least square adjustment for fit.

The number of parameters utilized for the adjustment shall be seven, and shall consist of pitch, roll, yaw, scale, swing, and x, y position of nadir reference. The instrument will be aligned and calibrated to yield a CPE of 100 microns as a design goal.

b. Total distortions from all sources shall be minimized to the extent that a calibrated grid (furnished by Government), of 50 or more known points uniformly distributed over the entire format (35 degrees each side of nadir normal to the flight direction), shall, when projected, produce a rectified enlargement on which known points will have a CPE not greater than 1000 microns at the enlarged scale after a least square adjustment for fit.

The number of parameters utilized for the adjustment shall be four, and shall consist of scale, swing, and x, y position of nadir reference. The instrument will be aligned and calibrated to yield a CPE of 100 microns as a design goal.

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Paragraph IV-A General

A. General - A preliminary acceptance test will be conducted at the Contractor's facilities on the rectifier prior to shipment to the receiving agency according to the Plan of Testing Procedures. A final acceptance test will be conducted at the users facility after installation and alignment according to the Plan of Testing Procedures. The test will determine resolution, accuracy and reliability of the equipment and whether these factors meet the required specifications. The following specifications must be met and acceptable at the users facility at 0^0 and through the range of $+10^0$ to $+20^0$ tilt.

Paragraph IV-A Accuracy

2. Accuracy - The error analysis shall be performed by two methods: (a) a seven parameter least square fit, and (b) a four parameter least square fit. The error in the seven parameter analysis, when the output rectified grid is referred to the true computer position, shall not exceed a CPE of 250 microns. The error is the four parameter analysis, when the output rectified grid is referred to the true computer positions, shall not exceed a CPE of 1000 microns.

25X1 will prepare two computer programs to be compatible with the computer located at Army Map Service; specified as follows: Computer 7094 Model 2 Fortran 4 IBSYS Version 13. The first program will establish a seven parameter least square fit adjustment. The second program will establish a four parameter least square fit adjustment.

Paragraph IV-C Accuracy Tests

C. Accuracy Tests. The preliminary accuracy test (performed at Contractor's facility) will consist of exposing a square calibrated grid of 50 or more known points uniformly distributed over the entire format (35 degrees each side of nadir normal to the flight direction) onto the copy easel for the middle altitude setting and for a tilt angle set to 15 degrees. The film on which the grid will be projected should be a polyester base film. The projected grids, after processing, will be measured and compared against the true mathematically projected values.

The final accuracy test (performed at users site) will consist of exposing a square calibrated grid of 50 or more known points uniformly distributed over the entire format (35 degrees each side of nadir normal

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to the flight direction) onto the copy easel for the minimum, middle and maximum altitude settings and for tilt angles set to -5^{o}, 0^{o}, $+5^{o}$, $+10^{o}$, $+15^{o}$, and $+20^{o}$. The same tests will be repeated two (2) additional times except for the -5^{o} and $+5^{o}$ tilt settings. The projected grids, after processing, will be measured and compared against the true mathematically projected values. The detailed tests will be conducted according to the Plan of Testing Procedures.

Paragraph IV-E Evaluation of Tests

E. Evaluation of Tests. The testing program will be divided into two phases. Phase I will be preliminary acceptance tests performed at the Contractor's facilities. Phase II will be final acceptance tests performed at the users site.

Phase I

The projected resolution targets will be prepared and read at the Contractor's facility. The projected grid will be prepared at the Contractor's facility and be read at the Army Map Service (AMS) by cleared Contractor personnel.

The resulting accuracy determination will be made by Contractor personnel in conjunction with AMS personnel.

Phase II

The projected resolution targets will be prepared and read at the AMS facility. The projected grids will be prepared and read at the AMS facility by cleared Contractor personnel and AMS personnel. The resulting accuracy determination will be made by Contractor personnel in conjunction with AMS personnel.

The following will be added as a contract item:

VII Plan of Testing Procedures

The Contractor will submit a Plan of Testing Procedures sixty (60) days prior to initiation of the preliminary tests for approval by the Government. Acceptance of the Plan of Testing Procedures shall not exceed thirty (30) days.

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The addendum to the Purchase Description for Gamma I Rectifiers dated 21 March 1966 shall be modified as follows:

Paragraph I-C Earth Curvature

Earth curvature shall be compensated for by an adjustable radius easel with sufficient range to permit the easel radius to change from 47 feet to 126 feet and to be set at a single radius of approximately 900 feet. All adjustments shall be calibrated for convenient settings with direct reading dials.